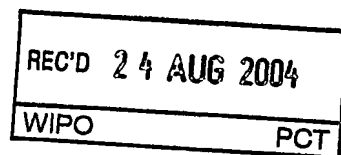




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Patent Office
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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004903406 for a patent by CTECH CLOSURES PTY LTD as filed on 22 June 2004.



WITNESS my hand this
Twelfth day of August 2004

J. Billingsley

JULIE BILLINGSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES

**PRIORITY
DOCUMENT**

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Tamper evident closure with improved tamper evident means and means of dispensing one or more additives into a container and a tamper proof cover to protect additive dispensing means.

There exists extensive prior art for tamper evident closures and means of manufacture thereof for example US Patents 6,640,988 and 6,551,093 both of which are hereby incorporated in this application.

The present invention in a non-limiting disclosure is described as a closure with or without tamper evident means but preferably having tamper evidence means and a dispensing means to dispense into a container connected to the said closure one or more additives contained within the said additive dispensing means. Said container may for example contain a beverage.

The advantages of such a dispensing device include the ability to keep the said additives such as but not limited to a vitamin supplement or flavour additive in the form of a tablet or powder or liquid separate from both of the atmosphere and contents of the container until the time of use by the consumer.

We disclose a non-limiting example as follows

Fig. 1 shows a closure 10 having

**a top wall 20 having
a circular opening of diameter 'P' formed in the said top wall having
on the free edge of the said circular opening one or more annular ridges
or sealing engagement means 21**

**a depending skirt 30 having
helical threads 31 co-operating with corresponding helical neck threads
66 to apply and remove said closure to and from container neck 60.**

Fig. 2 shows a closure 10 with

**a plunger housing 200 shown as a separate element but alternatively (Fig. 4.)
manufactured as part of closure 10 with appropriate deletion and or modification
to items 202 and 203 and 21. Said plunger housing being open at least at one
end adjacent to annular retention and interference sealing features 201 and
having**

**an outer wall 208 of diameter 'R' which is in sealing engagement with
annular sealing engagement means 21 (Fig. 1) and**

an inner wall 209 which has one or more annular retention and interference sealing features 201 and 201A and which are in sealing engagement with outer wall 222 of plunger actuator 220 and where annular retention and interference sealing features 201A serves to retain plunger actuator 220 in a non- actuated position until force acting in direction 'Q' upon actuation of plunger 220 is sufficient to cause said annular retention and interference sealing feature 201A and at least annular sealing engagement feature 225 closest to plunger end wall 221 to deflect and allow the said plunger end wall to travel downwards and

retention engagement means 202 which is ramped so as to more easily insert the said plunger housing into orifice 'P' (Fig. 1) and

retention means 203 or 203A (203A shown as dotted line) which may (not shown) extend further from the axis of the closure thereby having a larger diameter and

annular end wall 207 to which is affixed sealing device 205 and

sealing device 205 of aluminium foil or of plastic or other suitable material sealingly covering the open end of the plunger housing 200. Alternatively (not shown) sealing device 205 may instead form part of plunger housing 200 and be manufactured with lines of weakness to facilitate penetration of sealing device 205 when plunger 220 is actuated by moving it in the direction 'Q'

a plunger actuator 220 with

an annular disc 224 with designed to be pressed downwards (in the direction 'Q') to drive and activate an additive injection feature and is formed with and attached to Annular outer wall 222 and Annular inner wall 223 and

Annular sealing engagement features 225 formed on annular outer wall 222 and

Annular end wall 221 which may as an alternative be angled similar to dotted line 221A and which end wall 221 or 221A may be an annular ring or end of open cylinder or a solid disc to form a closed end cylinder (Ref Fig. 4) and

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An additive element 230 shown by dotted lines. Non limiting examples of the said additive element being one or more of a capsule or tablet or liquid or powder of any one or more of

- Vitamins
- diet supplement
- herbal product
- alcoholic beverage or spirit
- condiment
- sweetener
- flavouring

which may be separately sealed within a packaging material such as aluminium foil. Said additive element occupying a substantial portion of the space bounded by

- plunger housing
 - inner wall 209 and
 - outer wall 208 and
 - sealing device 205 and
- plunger actuator end wall 221 or 221A and

The said additive element being kept separate from the contents of the container (container not shown) and separate from the atmosphere by

- plunger housing
 - inner wall 209 and
 - outer wall 208 and
 - annular sealing engagement features 201 and 201A
 - sealing device 205 and
- plunger actuator
 - end wall 221 or 221A and
 - annular sealing engagement features 225

Where said additive element is contained within separate packaging then one end wall of the said separate packaging will at least extend to the annular edge of the outer wall 208 and said separate packaging will be affixed and sealed to the end wall 207 similar to as shown by the position of sealing element 205 or sealed to the end wall 207 and the immediately adjacent outer wall 208 so that the material outer edges of the said separate packaging are retained on the end walls 207 so that the additive element may be pushed into the contents of the container through the end of the said separate packaging by the movement of the end wall or disc 221 or 221A when the plunger actuator 220 is moved to its full extent in direction 'Q'.

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The relative location of end wall or end wall disc 221 or 221A of plunger actuator 220 shall be designed so that the distance travelled in direction 'Q' by the said end wall or end wall disc 221 or 221A shall always be designed such that the additive element 230 is completely ejected from plunger housing 200 when the lower wall 227 of actuator 224 comes in contact with upper wall 210 of plunger housing 200.

After injection of the additive element the closure 10 removed by unscrewing in the normal manner to access the contents of the container.

Referring to Fig. 3 Alternatively the plunger actuator 220 may be so designed that the end 221 is open and the actuator disc 224 is formed separately as a cover cap or closure 240 which is attached by known means such as thread or clip means 241 to co-operating thread or clip means 228 formed on at least one of outer wall 222 and inner wall 223. Stop means 229 on the outer wall of plunger actuator cylinder 226 restrain the extent of movement of said plunger actuator cylinder in direction 'Q' upon stop means 229 abutting upper wall 210 of plunger housing 200.

After injection of the additive element into the container the said cover cap 240 may be removed and the contents of the container will thereby be in fluid communication the open end of plunger actuator cylinder 226 and easily accessible by the user.

In another version (not shown) the cover cap 240 and the and the plunger actuator cylinder 226 could be formed as a 2 piece assembly operating similarly to prior art re-sealable dispensing closures extensively referred to in the closure manufacturing and marketing industries as a "push-pull cap" or a "sports cap" or a "twist top" cap where a re-closable opening allowing fluid communication between the inside of the container and an opening in the end of the said actuator cylinder is achieved by pulling a push - pull type dispensing cap or twisting a twist type dispensing cap. A tamper evident cover may also be usefully added to hygienically cover the plunger actuator and/or the said dispensing cap.

Referring to Fig. 4 we show an alternate arrangement which has the advantage of avoiding the need for Plunger housing 200 and sealing device 205 each to be manufactured separately and separately incorporated in the closure assembly.

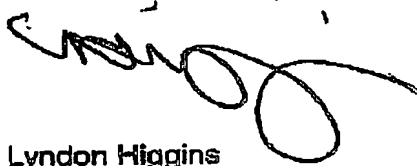
Plunger housing 200 is formed as part of closure 30 and sealing device 205 is formed as part of the said plunger housing. Said sealing device or end closure 205 may have a line of weakness with thin wall section for example at the juncture with the annular end wall 207 such that upon pressure moving plunger actuator in direction 'Q' additive element 230 will be forced against inner wall 214 of sealing device or end closure 205 which will cause sealing device 205 to separate from said annular end wall 207 at least partially and continued movement of plunger actuator will force additive element 230 into the interior of the container for mixing with the contents of the container.

Inner wall 214 may alternatively have one or more raised elements or projections 216 (not shown) and plunger actuator 220 having an annular disc or end seal 221B (not shown) joining inner wall 223 adjacent to end 221 of and sealing said end of plunger actuator cylinder 226. Said raised elements are so designed that upon sufficient movement of plunger actuator in direction 'Q' the outer wall of annular disc 221B and inner wall 214 may move into close proximity thereby compressing and piercing sachet additive element 230. Said annular disc or end seal 221B (not shown) may advantageously have recesses 221C (not shown) which correspond with said raised elements or projections 216 so that the outer wall of annular disc 221B and inner wall 214 may move into close proximity thereby substantially ejecting the contents of the sachet into the container. Perforations or potential perforations defined by weakened areas (not shown) in either or both of sealing device or end closure 205 or plunger actuator cylinder 226 allow or when weakened areas rupture when placed under pressure by movement of plunger actuator 220 in direction 'Q' allow ejection of additive element contents into the container. In this configuration sealing element 205 is firmly attached to end wall 207 of plunger housing 200.

Alternatively, said raised elements may be located on annular disc or end seal 221B (not shown) and co-operate with recesses or perforations (not shown) in sealing device 205 such that sachet additive element 230 is pierced and the contents thereof ejected into the container.

Alternatively plunger actuator cylinder may not have end seal 221B but instead be an open ended cylinder which may house at least partially an additive element 230 which by movement of lower wall 227 of plunger actuator in direction 'Q' is compressed and ruptured against inner wall 214 and raised elements or projections 216 .

Those skilled in the art may devise alternate versions of this closure and dispensing system without departing from the present invention.



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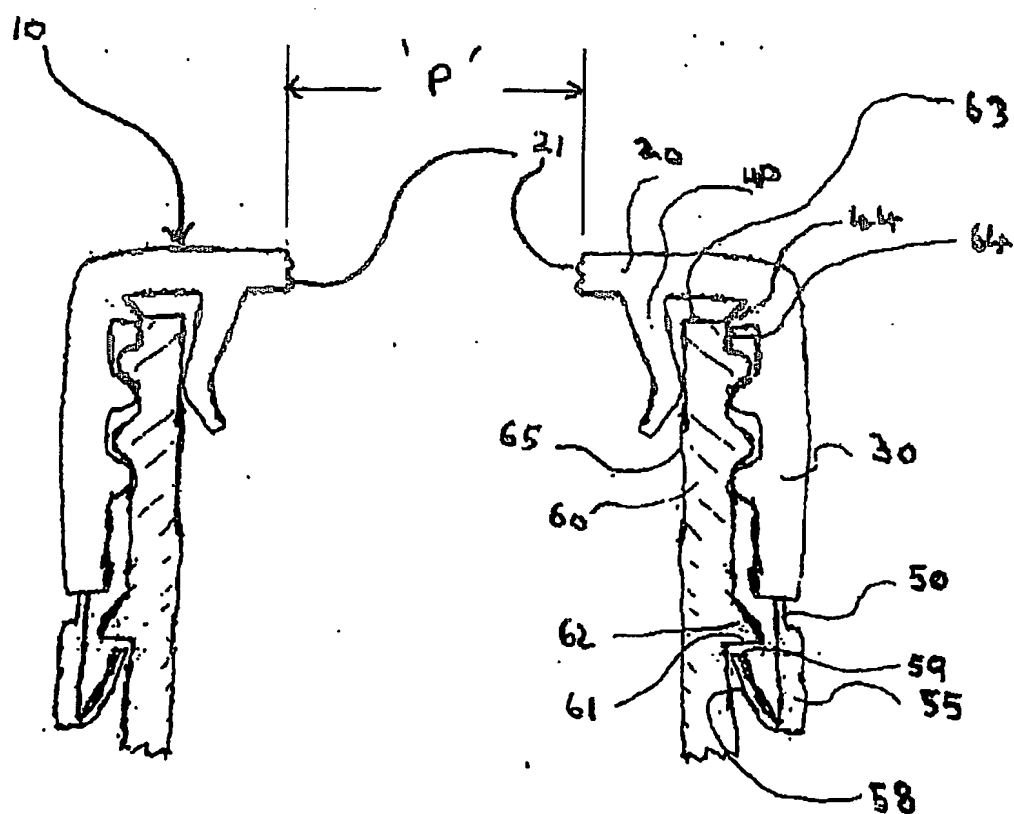


FIG. 1.

